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1 Circuits for low power wireless: Architectures for low power ultra-wideband radio receivers in the 3.1-5GHz band for data rates < 10Mbps

Marian Verhelst, Wim Vereecken, Michiel Steyaert, Wim Dehaene

August 2004 Proceedings of the 2004 international symposium on Low power electronics and design

Full text available: ddf(219.58 KB) Additional Information: full citation, abstract, references, index terms

This paper compares different receiver architectures for UWB radio communication in the 3.1-5GHz band, targeting data rates up to 10Mbps, in terms of their BER performance and power consumption. A receiver, in which some correlations are carried out in the analog domain seems to outperform a fully digital receiver, commonly suggested for baseband UWB. This paper proves that for equal processing gain requirements the partially analog receiver consumes 7 times less power per received bit than the ...

Keywords: architectures, receiver, ultra-wideband

System architectures for computer music

John W. Gordon

June 1985 ACM Computing Surveys (CSUR), Volume 17 Issue 2

Full text available: pdf(4.61 MB)

Additional Information: full citation, abstract, references, citings, index terms, review

Computer music is a relatively new field. While a large proportion of the public is aware of computer music in one form or another, there seems to be a need for a better understanding of its capabilities and limitations in terms of synthesis, performance, and recording hardware. This article addresses that need by surveying and discussing the architecture of existing computer music systems. System requirements vary according to what the system will be used for. Common uses for co ...

Energy efficient mobile computing: Energy-efficient communication protocols Carla F. Chiasserini, Pavan Nuggehalli, Vikram Srinivasan June 2002 Proceedings of the 39th conference on Design automation

Full text available: mpdf(307.00 KB) Additional Information: full citation, abstract, references, index terms

Wireless networking has experienced a great deal of popularity, and significant advances have been made in wireless technology. However, energy efficiency of radio communication systems is still a critical issue due to the limited battery capacity of portable devices. In this

paper, we deal with the charge recovery effect that takes place in electrochemical cells and show how we can take advantage of this mechanism to increase the energy delivered by a battery. Then, we present energy-aware traf ...

Keywords: battery charge recovery, energy efficiency, wireless networks

Energy estimation tools for the Palm

Todd L. Cignetti, Kirill Komarov, Carla Schlatter Ellis

August 2000 Proceedings of the 3rd ACM international workshop on Modeling, analysis and simulation of wireless and mobile systems

Full text available: pdf(1.04 MB)

Additional Information: full citation, abstract, references, citings, index terms

Reducing the energy consumed in the use of mobile and wireless devices is becoming a major design challenge. While the problem obviously must be addressed with improved low-level technology, we have advocated also considering a higher-level view in which energy management becomes an explicit design goal of the software developer who can be more aware of the needs of applications. In support of this objective, new programming models, measurement tools, and simulation environments mus ...

5 Wireless intraoffice networks

K. Pahlavan

July 1988 ACM Transactions on Information Systems (TOIS), Volume 6 Issue 3

Full text available: pdf(1.98 MB)

Additional Information: full citation, abstract, references, citings, index terms, review

An overview of the existing and growing demands for wireless office information networks is provided, and the existing research activities are assessed in some detail. The radio frequency (RF) and infrared (IR) communication technologies are examined as candidates for wireless intraoffice communications. The available bandwidths, according to federal regulations and characteristics of the channel for RF communications, are given. Digital narrow-band and wideband spread-spectrum RF communica ...

Sparse matrix methods for chemical process separation calculations on supercomputers

S. E. Zitney

December 1992 Proceedings of the 1992 ACM/IEEE conference on Supercomputing

Full text available: (2) pdf(938.87 KB) Additional Information: full citation, references, citings, index terms

Energy efficient Modulation and MAC for Asymmetric RF Microsensor Systems Andrew Wang, SeongHwan Cho, Charles Sodini, Anantha Chandrakasan August 2001 Proceedings of the 2001 international symposium on Low power electronics and design

Full text available: pdf(207.78 KB) Additional Information: full citation, references, citings, index terms

I_{DDX}-based test methods: A survey

Sagar S. Sabade, Duncan M. Walker

April 2004 ACM Transactions on Design Automation of Electronic Systems (TODAES),

Volume 9 Issue 2

Full text available: pdf(1.83 MB) Additional Information: full citation, abstract, references, index terms

Supply current measurement-based test is a valuable defect-based test method for semiconductor chips. Both static leakage current (I_{DDQ}) and transient current (I_{DDT}) based tests have the capability of detecting unique defects that improve the fault detection capacity of a test suite. Collectively these test methods are known as I_{DDX} tests. However, due to advances in the semiconductor manufacturing process, the future of these test methods is uncertain. This pape ...

Keywords: I_{DDO} , I_{DDT} test, VLSI testing, test

9 Time multiplexed optical computers

Harry F. Jordan, Vincent P. Heuring

August 1991 Proceedings of the 1991 ACM/IEEE conference on Supercomputing

Full text available: pdf(818.47 KB) Additional Information: full citation, references, citings, index terms

10 Voice response systems

D L. Lee, F H. Lochovsky

December 1983 ACM Computing Surveys (CSUR), Volume 15 Issue 4

Full text available: pdf(2.22 MB) Additional Information: full citation, references, index terms

11 Location (here): WALRUS: wireless acoustic location with room-level resolution using ultrasound

Gaetano Borriello, Alan Liu, Tony Offer, Christopher Palistrant, Richard Sharp
June 2005 Proceedings of the 3rd international conference on Mobile systems,
applications, and services

Full text available: pdf(295.20 KB) Additional Information: full citation, abstract, references

In this paper, we propose a system that uses the wireless networking and microphone interfaces of mobile devices to determine location to room-level accuracy. The wireless network provides a synchronizing pulse along with information about the room. This is accompanied by an ultrasound beacon that allows us to resolve locations to the confines of a physical room (since audio is mostly bounded by walls). We generate the wireless data and ultrasound pulses from the existing PCs in each room; a PDA ...

12 Issues in satellite personal communication systems

Erich Lutz

February 1998 Wireless Networks, Volume 4 Issue 2

Full text available: pdf(742.57 KB)

Additional Information: full citation, abstract, references, citings, index

In the paper various issues in personal satellite communications are addressed. Basic geostationary and non-geostationary satellite constellations are considered. The narrowband and wideband characterization of the mobile satellite channel and related system implications are discussed. Satellite diversity is presented as a measure to overcome signal shadowing. The capacity of TDMA and CDMA multiple access is estimated, taking into account co-channel interference. Various network issues, suc ...

13 Denoising Source Separation

Jaakko Särelä, Harri Valpola

April 2005 The Journal of Machine Learning Research, Volume 6

Full text available: pdf(2.02 MB) Additional Information: full citation, abstract

A new algorithmic framework called denoising source separation (DSS) is introduced. The main benefit of this framework is that it allows for the easy development of new source separation algorithms which can be optimised for specific problems. In this framework, source separation algorithms are constructed around denoising procedures. The resulting algorithms can range from almost blind to highly specialised source separation algorithms. Both simple linear and more complex nonlinear or adaptive ...

14 <u>Special section on impact of quantum technologies on networks and networking research: Infrastructure for the quantum internet</u>



Seth Lloyd, Jeffrey H. Shapiro, Franco N. C. Wong, Prem Kumar, Selim M. Shahriar, Horace P. Yuen

October 2004 ACM SIGCOMM Computer Communication Review, Volume 34 Issue 5

Full text available: doi: 10.000 Additional Information: full citation, abstract, references, index terms

A team of researchers from the Massachusetts Institute of Technology (MIT) and Northwestern University (NU) is developing a system for long-distance, high- delity qubit tele-portation. Such a system will be required if future quantum computers are to be linked together into a quantum Internet. This paper presents recent progress that the MIT/NU team has made, beginning with a review of the teleportation architecture and its loss-limited performance analysis.

Keywords: entanglement, quantum communication, quantum memory, qubits, teleportation

15 Synthesizing auditory icons

William W. Gaver



Full text available: pdf(980,54 KB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> <u>terms</u>

Auditory icons add valuable functionality to computer interfaces, particularly when they are parameterized to convey dimensional information. They are difficult to create and manipulate, however, because they usually rely on digital sampling techniques. This paper suggests that new synthesis algorithms, controlled along dimensions of events rather than those of the sounds themselves, may solve this problem. Several algorithms, developed from research on auditory event perception, are descri ...

Keywords: auditory interfaces, interface techniques, multimedia, sound

16 <u>Military applications: Generic models in the advanced IRCM assessment model</u> David P. Forrai, James J. Maier

December 2001 Proceedings of the 33nd conference on Winter simulation

Full text available: pdf(323.39 KB) Additional Information: full citation, abstract, references, index terms

The Advanced IRCM Assessment Model (AIRSAM) simulates an infrared (IR) guided missile engaging an aircraft equipped with infrared countermeasures (IRCM). Analysts currently use AIRSAM to predict the most likely IRCM response by an aircraft when engaged. The analyst often attempts to determine responses using IRCM or threat systems that are not characterized in detail. For AIRSAM to be an effective simulation for this purpose, the models for IRCMs and threat systems must allow the user to adjust ...

17 Systems II: Hardware design experiences in ZebraNet

Pei Zhang, Christopher M. Sadler, Stephen A. Lyon, Margaret Martonosi November 2004 Proceedings of the 2nd international conference on Embedded networked sensor systems



Full text available: pdf(472.66 KB) Additional Information: full citation, abstract, references, index terms

The enormous potential for wireless sensor networks to make a positive impact on our society has spawned a great deal of research on the topic, and this research is now producing environment-ready systems. Current technology limits coupled with widely-varying application requirements lead to a diversity of hardware platforms for different portions of the design space. In addition, the unique energy and reliability constraints of a system that must function for months at a time without human i ...

Keywords: GPS, ZebraNet, sensor deployment, sensor networks

18 Low power converter circuits: 2.45 GHz power and data transmission for a low-power autonomous sensors platform



Stefano Gregori, Yunlei Li, Huijuan Li, Jin Liu, Franco Maloberti

August 2004 Proceedings of the 2004 international symposium on Low power electronics and design

Full text available: pdf(710.58 KB) Additional Information: full citation, abstract, references, index terms

This paper describes a power conversion and data recovery system for a microwave powered sensor platform. A patch microwave antenna, a matching filter and a rectifier make the system frontend and implement the RF-to-DC conversion of power carrier. The efficiency of the power conversion is as high as 47% with an input power level 250 μW at 2.45 GHz. Then, a 0.18 μm CMOS integrated circuit extracts the clock and the digital data. A modified pulse amplitude modulation scheme is used to modulate the ...

Keywords: RF to DC power conversion, low power clock and data recovery, microwave power transmission, wireless sensor

19 Channelization: A single-channel solution for transmission power control in wireless ad hoc networks



Alaa Muqattash, Marwan Krunz

May 2004 Proceedings of the 5th ACM international symposium on Mobile ad hoc networking and computing

Full text available: pdf(251.45 KB) Additional Information: full citation, abstract, references, index terms

Transmission power control (TPC) has a great potential to increase the throughput of a mobile ad hoc network (MANET). Existing TPC schemes achieve this goal by using additional hardware (e.g., multiple transceivers), by compromising the collision avoidance property of the channel access scheme, or by imposing impractical requirements on the operation of the MAC protocol. In this paper, we present a novel power control MAC protocol, known as POWMAC, for MANETs that enjoys the same simple single-c ...

Keywords: IEEE 802.11, ad hoc networks, interference margin, load control, multi-access interference, power control, throughput enhancement

20 Closing the power gap between ASIC and custom: Closing the power gap between ASIC and custom: an ASIC perspective



D. G. Chinnery, K. Keutzer

June 2005 Proceedings of the 42nd annual conference on Design automation

Full text available: pdf(218.35 KB) Additional Information: full citation, abstract, references, index terms

We investigate differences in power between application-specific integrated circuits (ASICs) and custom integrated circuits, with examples from 0.6um to 0.13um CMOS. A variety of factors cause synthesizable designs to consume '3 to '7 more power. We discuss the shortcomings of typical synthesis flows, and changes to tools and standard cell libraries needed to reduce power. Using these methods, we believe that the power gap between ASICs and custom circuits can be closed to within 2'.

Keywords: ASIC, comparison, custom, energy, power, standard cell

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